

FORM PTO-100  
(REV. 5-01)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (PCT/PTO) 09/868159

INTERNATIONAL APPLICATION NO.

PCT/DE99/03336

INTERNATIONAL FILING DATE

14 October 1999

PRIORITY DATE CLAIMED

15 December 1998

TITLE OF INVENTION

DETACHABLE ASSEMBLY OF TWO ELEMENTS

APPLICANT(S) FOR DO/EO/US

NIKLAUS, Hilmar

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 19(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).


Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.  
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: International Preliminary Examination Report

"Express Mail" mailing label number ET 302677923 US

Date of Deposit June 13, 2001

I hereby certify that this paper is being deposited with the U.S. Postal Service "Express Mail-Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Hon. Commissioner of Patents and Trademarks, Washington, D. C. 20231.



Edwin D. Schindler, Reg. No. 31,459

June 13, 2001

Date

17: ☒ The following fees are submitted:

**Basic National Fee (37 CFR 1.492(a)(1)-(5)):** \$860.00  
Search Report has been prepared by the EPO or JPO..... ~~\$860.00~~

International preliminary examination fee paid to USPTO (37 CFR 1.482)..... \$640.00  
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).. \$710.00

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$950.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$90.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

\$ 860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ -0-

Claims	Number Filed	Number Extra	Rate
Total Claims	-20 =		X \$22.00
Independent Claims	-3 =		X \$74.00
Multiple dependent claims(s) (if applicable)			+ \$230.00

**TOTAL OF ABOVE CALCULATIONS =** \$ 860.00

Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).

\$ -0-

**SUBTOTAL =** \$ 860.00

Processing fee of \$130.00 for furnishing the English translation later the ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).

\$ -0-

**TOTAL NATIONAL FEE =** \$ 860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$ -0-

**TOTAL FEES ENCLOSED =** \$ 860.00

Amount to be:  
refunded \$  
charged \$

- a. ☒ A check in the amount of \$ \*\*860.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 19-0450. A duplicate copy of this sheet is enclosed.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Edwin D. Schindler  
Five Hirsch Avenue  
P. O. Box 966  
Coram, New York 11727-0966

SIGNATURE

Edwin D. Schindler

NAME

31,459

REGISTRATION NUMBER

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: HILMAR NIKLAUS ART UNIT:

SERIAL NO.: 09/ EXAMINER:

FILED: CONCURRENTLY HERewith

P.C.T. APPLICATION NO.: PCT/DE99/03336

P.C.T. INTERNATIONAL FILING DATE: OCTOBER 14, 1999

U.S. NATIONAL FEE PAID: JUNE 13, 2001

TITLE: DETACHABLE ASSEMBLY OF TWO ELEMENTS

PRELIMINARY AMENDMENT

Hon. Commissioner for Patents  
United States Patent and Trademark Office  
Box PCT  
Washington, D. C. 20231

Dear Sir:

Prior to an examination on the merits of the above-identified patent application, please amend the English translation of the above-identified application as follows:

IN THE ABSTRACT OF THE DISCLOSURE

Please use the accompanying Abstract of the Disclosure,

"Express Mail" mailing label number ET 302678420 US  
Date of Deposit June 22, 2001

I hereby certify that this paper is being deposited with the U.S. Postal Service "Express Mail - Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above and is addressed to: Hon. Commissioner for Patents, United States Patent and Trademark Office, Washington, D. C. 20231.

  
Edwin D. Schindler, Reg. No. 31,459

June 22, 2001  
Date

which is contained on a separate sheet of paper, as required by 37 C.F.R. §1.72(b), as the Abstract for the instant patent application.

IN THE SPECIFICATION

Please amend the Specification follows:

Page 1, between lines 1-3 (immediately beneath the Title of the Invention), insert the following headings:

--BACKGROUND OF THE INVENTION--; and,

--Technical Field of the Invention--; and,

between lines 15-16, insert the following heading:

--Description of the Prior Art--.

Page 3, between lines 5-6, insert the following heading:

--SUMMARY OF THE INVENTION--; and,

lines 24-26, delete "is rotatable about an axis that is . . . approximately parallel thereto."

Page 9, between lines 11-12, insert the following heading:

--BRIEF DESCRIPTION OF THE DRAWING FIGURES--; and,

between lines 21-22, insert the following heading:

--DETAILED DESCRIPTION OF THE DRAWING FIGURES

AND PREFERRED EMBODIMENTS --.

IN THE CLAIMS

Please cancel Claims 1-16, as filed before the IPEA/EP on January 25, 2001, and substitute the following claims therefor:

--17. A detachable connection of two elements, comprising:

a bolt arranged between the two elements detachably connected;

a tensioning body for fixing said bolt at one end to one element of the two elements, said tensioning body being rotatable relative to said one element about an axis extending substantially perpendicular to said bolt with said tensioning body being fixed in any rotational position relative to said bolt; and,

means for fastening said bolt to said tensioning body, said means for fastening being rotatable about an axis that is distanced from the axis of said tensioning body and substantially parallel thereto, said means for fastening including a retaining head detachably attached to said bolt and being rotatable relative to said tensioning body.

18. The detachable connection of two elements according to Claim 17, wherein said bolt has a second end opposite said one end, or said first end, with said second end of said bolt being fastened a second element of said two elements.

19. The detachable connection of two elements according to Claim 17, wherein said bolt has a second end opposite said one end, or said first end, with said bolt being fixed at its said second end via an additional tensioning body to a second element of said two elements, said additional tensioning body being rotatable relative to said second element about an axis extending substantially perpendicular to said bolt, and further comprising additional means for fastening said additional tensioning body to said bolt, said additional means for fastening being rotatable about an axis distanced from an axis of said additional tensioning body and substantially parallel thereto, said additional tensioning body being fixed in any rotational position relative to said bolt.

20. The detachable connection of two elements according to Claim 17, wherein said bolt penetrates at least one of said two elements.

21. The detachable connection of two elements according to Claim 17, further comprising a third element in addition to said two elements, wherein said bolt penetrates said third element arranged between said two elements.

22. The detachable connection of two elements according to Claim 17, wherein said tensioning body is accommodated in of said one element of said two elements fixing said tensioning body.

23. The detachable connection of two elements according to Claim 17, wherein said retaining head is detachably connected to said tensioning body.

24. The detachable connection of two elements according to Claim 17, wherein said retaining head has a slot extending in substantially an axial direction of said tensioning body, engaging at both ends of said bolt in a groove extending in an azimuthal direction of said bolt.

25. The detachable connection of two elements according to Claim 24, wherein said groove of said bolt is a surrounding annular groove.

26. The detachable connection of two elements according to Claim 17, wherein said bolt is accommodated in an extra-axial cavity of said tensioning body, which is fixed in a longitudinal direction of said bolt.

27. The detachable connection of two elements according to Claim 17, wherein said retaining head is accommodated in an extra-axial cavity of said tensioning body, which is fixed in a longitudinal direction of said bolt.

28. The detachable connection of two elements according to Claim 17, wherein said bolt penetrates an azimuthally extending slot of said tensioning body.

29. The detachable connection of two elements according

to Claim 28, wherein said tensioning body has an axial end face, there extending between said axial end face and the azimuthally extending slot of said tensioning body, a substantially axial slot having a width greater than a diameter of said bolt.

30. The detachable connection of two elements according to Claim 17, wherein said tensioning body is of a substantially cylindrical shape.

31. The detachable connection of two elements according to Claim 17, wherein said retaining head is of a substantially cylindrical shape.

32. The detachable connection of two elements according to Claim 17, wherein said one element of said two elements is open on an axial end face.

33. The detachable connection of two elements according to Claim 17, wherein a cavity of said tensioning body is open on an axial end face.

34. The detachable connection of two elements according to Claim 17, wherein said one element of said two elements is closed on an axial end face.

35. The detachable connection of two elements according to Claim 17, wherein a cavity of said tensioning body is closed on an axial end face.--



REMARKS

Prior to an examination on the merits of the above-identified patent application, please enter the foregoing amendments.

Claims 17-35 are now pending in the above-identified patent application, as presented by the instant Preliminary Amendment. Claim 17 is the single claim presented in independent form.

The present application represents the U.S. National Phase of P.C.T. Application No. PCT/DE99/03336, filed October 14, 1999, and claiming foreign priority on the basis of a corresponding Federal Republic of Germany patent application, filed December 15, 1998.

The claims being entered via the present Preliminary Amendment are intended to substitute for Claims 1-16 of the P.C.T. international application, as amended on January 25, 2001. An English translation of the amended disclosure and claims is being concurrently filed.

New Claims 17-35, which have been drafted in conformance with U.S. claim practice. Various formal amendments have also been entered to the Specification, and an Abstract for the application, on a separate sheet of paper, is enclosed.

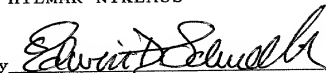
The application is now in condition for a full examination on the merits.

Accordingly, an early examination on the merits and allowance are, therefore, respectfully requested and earnestly solicited.

Respectfully submitted,

HILMAR NIKLAUS

By



Edwin D. Schindler  
Attorney for Applicant  
Reg. No. 31,459

Five Hirsch Avenue  
P. O. Box 966  
Coram, New York 11727-0966

(631)474-5373

June 22, 2001

ABSTRACT OF THE DISCLOSURE

A detachable connection of two elements, includes a bolt, or shaft, arranged between the two elements detachably connected, and a tensioning body for fixing the bolt at one end to one element of the two elements. The tensioning body is rotatable relative to the one element about an axis extending substantially perpendicular to the bolt, with the tensioning body being fixed in any rotational position relative to the bolt. A retaining head for fastening the bolt to the tensioning body is included, with the retaining head being rotatable about an axis that is distanced from the axis of the tensioning body and substantially parallel thereto. The retaining head is detachably attached to the bolt and is rotatable relative to the tensioning body.

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Applicant: Niklaus, Hilmar

Name of Party in Interest:

Serial No:

Group Art Unit:

Filed: Concurrently Herewith

Examiner:

For: DETACHABLE CONNECTION OF TWO ELEMENTS

P.C.T. Application No.: PCT/DE99/01144

CLAIM FOR SMALL ENTITY STATUS

37 CFR 1.9(c) - INDEPENDENT INVENTOR

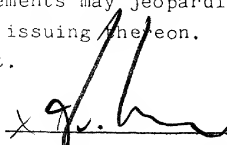
I Niklaus, Hilmar<sup>(a)</sup>, declare and say that:

1) I am the sole <sup>(b)</sup> ~~applicant/inventor~~ <sup>(b)</sup> named in the above-identified application for Letters Patent.

2) I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who could not likewise be classified as an independent inventor if that person had made the invention, or to any concern which would not qualify as a small business concern or a non-profit organization under 37 CFR 1.9.

I hereby declare that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful or false statements so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issuing thereon.

Further declarant sayeth not.

 \_\_\_\_\_ a)  
(Niklaus, Hilmar)

12.6.2001.  
date

Note: All joint inventors must sign separate declarations. Where an independent inventor has signed granted conveyed or licensed or is under an obligation to do so to a small entity that small entity also must file the appropriate declaration  
a) insert name of signatory inventor  
b) delete inapplicable words

WO 00/36308

PCT/DE99/03336

Detachable Connection of Two Elements  
-----

5 The invention relates to a detachable connection of  
two elements, between which at least one bolt is  
arranged and which is fixed at at least one end by  
means of a tensioning body attached to one of the  
elements, wherein the tensioning body is rotatable  
with respect to the element about an axis extending  
essentially perpendicular to the bolt, and the  
10 tensioning body is adhesively fixed in each  
rotational position with respect to the bolt and/or  
to the element.

15 Such connections for joining two elements, in  
particular of wood are known in the most diverse  
embodiments and are often used in furniture for  
producing corner connections. The bolt connects the  
two elements to one another and is fixed on one  
side by a tensioning body, which is usually  
accommodated in a cavity of the furniture article.  
20 The tensioning body usually has the form of a disc,  
which is rotatable in a ring and to which the bolt  
extends in a radial direction. To produce the  
connection, the bolt is introduced through a slot  
of the ring and the disc is rotated with respect to  
25 the ring and the bolt about an axis perpendicular  
to the disc plane, whereby a wedge integrally  
moulded on the disc pushes through an eye of the  
bolt and pulls said eye inwards as it is rotated  
further in the radial direction of the disc. The

WO 00/36308

PCT/DE99/03336

2

radial outer edge of the wedge extends approximately in the form of a circular arc, whose centre lies on the axis of rotation, as a radial delimitation of the disc along the ring, while the radial distance of the inner wedge edge, which bears against the eye, decreases progressively further from the axis of rotation of the disc, so that the eye is drawn inwards in the radial direction. At its other end, the bolt is fastened to another element, usually a lateral furniture wall, which, by tensioning of the bolt, is tightened against the element provided with the tensioning body. Friction between the disc and ring, but also between the disc and bolt, fixes the disc in the respective position. It is disadvantageous, however, that the tensioning body only bears against the rear end of the eye and can thereby transmit only tension forces to the bolt. With such connections, the bolt must stand constantly under tension, resulting in relatively high material fatigue. In addition, if the connection is to be detached again subsequently, no pressure load can be exerted via the bolt to force the elements apart. The elements would thus have to be forced apart with other tools.

The present invention has set itself the object of providing a detachable connection between elements in which both tension and pressure forces can be transmitted between the elements via a bolt.

WO 00/36308

PCT/DE99/03336

3

This object is achieved according to the invention in that the fastening of the bolt on the tensioning body is rotatable about an axis that is at a distance from the axis of the tensioning body and approximately parallel thereto.

The effect is that of an eccentric, via which the bolt is drawn or pushed in its longitudinal direction depending on the direction of rotation of the tensioning body. The maximum possible distance through which the bolt can be tensioned corresponds to twice the eccentricity.

As with the connections for furniture known from the state of the art, with the connections according to the invention, the bolt may also be fastened at its opposite end from the tensioning body to the other element. Alternatively the other end of the bolt may also be attached in the described manner to another tensioning body. Apart from the increase of the distance over which a tensioning of the bolt is possible, a tensioning force can be transmitted directly to both elements through the tensioning body attached thereto. This tensioning force would in some circumstances be partly taken up by the guide of the bolt.

As is already the case in the state of the art, with the connection according to the invention, the tensioning body can be secured against reverse rotation by friction occurring between the

WO 00/36308

PCT/DE99/03336

4

tensioning body and the element or else between the tensioning body and the bolt. If possible, however, the frictional force should act both through the bolt and through the element on the tensioning body, so that the fixing is more stable to loads.

By the fact that the bolts penetrates an element to a certain length, a tensioning of the articles with respect to one another is possible over a relatively long distance. The connection is thereby stable to shaking even with relatively low tensioning forces.

It is also possible that the bolt may penetrate a third element arranged between the two elements. Thereby it is possible to produce a cross connection or a post-and-crossbar connection. The first and second element may be formed by, for example, the post or the vertical crossbolt, whereas the third element is represented by the crossbar or horizontal crossbolt arranged between the aforesaid first and second elements. Alternatively it is also conceivable that the third element forms the post or vertical crossbolt.

As is known in the state of the art, the tensioning body may be fastened on an element by accommodating it in a cavity. In order that both tension and pressure forces can be transmitted to the bolt, the tensioning body must be fixed in the longitudinal direction of the bolt at both ends by the cavity.



WO 00/36308

PCT/DE99/03336

The fastening between the bolt and tensioning body can be produced by means of constructional measures permanently attached to or integrally moulded on the bolt. By contrast therewith, however, a retaining head detachably connected to the bolt is conceivable, which rotates with the bolt with respect to the retaining head. Since the bolt in this case need not bear any measures necessary for producing a rotatable connection, it can be shaped such that it can even be guided through narrow channels.

The retaining head can be permanently fastened on the tensioning body. Preferably, however, it is detachably connected to the tensioning body. When a repair is due it is possible only to exchange the retaining head or the tensioning body individually, and by exchanging the tensioning body a different eccentricity can be achieved with one and the same retaining head.

The bolt is preferably fixed in the retaining head by means of an axially extending slot whose flanks engage at both sides of the bolt in an azimuthally extending groove. It is conceivable that both flanks engage in the same groove, which surrounds the bolt through an angle of more than 180°, or that the bolt has two azimuthally grooves lying approximately radially opposite one another. Because of the axial alignment of the slot with respect to the tensioning body, the bolt is fixed

WO 00/36308

PCT/DE99/03336

6

in its longitudinal direction and, with rotation of the tensioning body, since the slot is aligned parallel to the two axes of rotation, no force component occurs in the longitudinal of the slot, through which the bolt could move along the slot and in the process detach from the retaining head. Here, it is simple to produce the connection between the bolt and retaining head by introducing the bolt into an opening of the slot. The handling of the bolt is by no means impaired by the groove.

In the ideal case, the groove of the bolt is to be embodied as a surrounding annular groove. In this case, the connection can be produced independently of the orientation of the tensioning body and retaining head relative to the longitudinal direction of the bolt.

A stable connection with a large contact area between the bolt end or retaining head and the tensioning body can be achieved by means of an extra-axial cavity accommodated in the tensioning body, in which cavity the retaining head or bolt end is to be accommodated such that it is fixed in the longitudinal direction of the bolt and can transmit both tension and pressure forces to the bolt.

In order that the tensioning body is not wedged by means forces acting via the bolt, the bolt on the tensioning body should be attached as far as

WO 00/36308

PCT/DE99/03336

7

possible centrally on the tensioning body with respect to its longitudinal direction. For this reason, the tensioning body has, for automatic alignment, an azimuthally extending slot which the bolt penetrates. A tensioning body with this feature may be of greater axial extension, which makes wedging even more difficult.

In order that, in the case of a tensioning body with azimuthally extending slot, the introduction of the bolt is simplified, the tensioning body additionally has an essentially axially extending slot, whose width, in order to allow introduction of the bolt, must be larger than the diameter of the bolt. In particular, this feature appears appropriate in combination with a slot of the retaining head, said slot extending essentially in an axial direction of the tensioning body and receiving the bolt. For introduction of the bolt, the retaining head is twisted in the tensioning body such that the two axially extending slots lie one behind the other in the radial direction. The bolt can now be introduced simultaneously both into the retaining head and into the tensioning body. After twisting of the tensioning body relative to the retaining head the bolt is fixed by the azimuthal slot of the tensioning body against a movement in the longitudinal direction of the slot produced in the retaining head.

WO 00/36308

PCT/DE99/03336

8

For both the cavity of the element, in which the tensioning body is rotatably mounted and the cavity of the tensioning body in which the retaining head is rotatably mounted, the shape of a cylinder is to be preferred. But also the outer contour of the tensioning body or retaining head is preferably formed in this shape in order that, in the case of a relatively large contact surface between the cavity of the element and the tensioning body or between a cavity of the tensioning body and the retaining head, the effect of the eccentric can be achieved. All the contours mentioned in this context are in the ideal case cylindrical.

Preferably a cavity of the element or of the tensioning body should be designed open at one axial side in order that it is accessible for introduction of the tensioning body or for producing the connection, and any repair work subsequently becoming due can be performed more easily.

The external appearance however is more appealing than in the case of locked cavities. In addition, by closure of a cavity it is achieved that the tensioning body or retaining head cannot become detached in an undesirable manner. It is also conceivable to combine the advantages of a closed cavity with those of an open cavity by forming the cavity open at one side and closed at the other side.

WO 00/36308

PCT/DE99/03336

Other details, features and advantages of the invention can be derived from the following descriptive part, which describes a typical embodiment of the invention with the aid of drawings, wherein, in diagrammatic view

Figure 1 shows the individual parts of the connection according to the invention, and

Figure 2 shows the individual parts in assembled form.

Figure 1 shows the connection according to the invention in perspective exploded view. It is formed by a bolt (3), which is fastened in a tensioning body (1) by means of a retaining head (2). The tensioning body (1) contains, offset with respect to its axis of rotation, a cylindrical cavity (4) to receive the retaining head (2) and therewith the bolt (3), as well as an azimuthal slot (5), through which the bolt (3) is guided outwards from the cavity (4), and an axial slot (6) for introduction of the bolt (3) on production of the connection. The retaining head (2) has the form of a hollow cylinder whose diameter is slightly smaller than the cavity (4) accommodated in the tensioning body (1) and has an axial slot (7) for receiving the bolt (3), which for its part is provided, in the vicinity of the end facing the tensioning body (19), with a groove (8), shown here

WO 00/36308

PCT/DE99/03336

10

as a surrounding annual groove, extending azimuthally with respect to the bolt (3), which groove is received to produce the connection from the axial slot (7) of the retaining head (2). As a result of the formation of the azimuthal groove (8) of the bolt (3) as surrounding annual groove, the connection can be made for any rotation angle of the bolt (3) about its axis.

At its other end, the bolt (3) also has a surrounding annual groove and can there be fixed on a further element or attached via a detachable connection similar to the way described. There are two possibilities for introducing the bolt (3) into the tensioning body (1): One consists in first introducing the retaining head (2) into the cavity (4) of the tensioning body (1) such that the axes of the retaining head (2) and cavity (4) become congruous and then twisting the retaining head (2) and tensioning body (1) with respect to one another about the axis of the cavity (4) or retaining head (2) such that the axial slot (7) of the retaining head (2) is aligned in an approximately radial direction behind the axial slot (6) of the tensioning body (1). Now the bolt (3) is introduced in the axial direction of the tensioning body (1) or retaining head (2) into the two axial slots (6 and 7, respectively) such that its groove (8) is received by the axial slot (7) of the retaining head (2). After the tensioning body (1) is twisted

WO 00/36308

PCT/DE99/03336

11

about its axis with respect to the retaining head (2), the bolt (3) penetrates the azimuthal slot (5) of the tensioning body (1). The other possibility consists in first introducing the bolt (3) via the groove (8) into the slot (7) of the retaining head (2) via the axial slot (6) into the tensioning body. After the tensioning body (1) has been twisted about its axis, the same result is obtained.

Figure 2 shows tensioning body (1), retaining head (2) and bolt (3) assembled in perspective view. In one axial direction, the retaining head is now fixed, because the cavity (4) of the tensioning body (1) there is closed in the other axial direction by the bolt (3), which for its part is fixed in the axial direction of the tensioning body by virtue of its azimuthal slot (5). The tensioning body (1) is in turn accommodated in an approximately cylindrical cavity of the element, whose cylinder diameter is slightly greater than that of the tensioning body (1). For transmitting tension or pressure forces (1) to the bolt (3), the tensioning body (1) is twisted in the cavity of the element, as a result of which the axis of rotation of the retaining head (2), by virtue of the fact that it is accommodated in an eccentrically arranged cavity (4) of the retaining head (2), describes a circular arc. The rotation of the tensioning body (1) compensates the retaining head

WO 00/36308

PCT/DE99/03336

12

(2) by a contra-rotation about its axis of symmetry, and in the process, depending on the direction of rotation, transmits tension or pressure forces to the bolt (3). If the mutually contacting surfaces of the elements, of the

5      tensioning body (1) and of the retaining head (2) are not too smooth, the tensioning body (1) is fixed in any rotational position by friction with the element or with the retaining head (2).

10      Overall, a detachable connection between two elements is obtained, by means of which, by means of a tensioning body (1) via a bolt (3), both tension and pressure forces can be transmitted.



WO 00/36308

PCT/DE99/03336

13

P A T E N T   C L A I M S

1. Detachable connection of two elements, between  
which at least one bolt is arranged and which is  
fixed at at least one end via a tensioning body  
attached to the element, the tensioning body  
being rotatable with respect to the element  
about an axis extending essentially  
perpendicular to the bolt and the tensioning  
body being fixed in any rotational position with  
respect to the bolt and/or to the element by  
adhesion wherein the fastening of the bolt (3)  
on the tensioning body (1) is rotatable about an  
axis that is distanced from the axis of the  
tensioning body (1) and approximately parallel  
thereto.
2. Connection according to claim 1, wherein the  
bolt (3) is fastened at its other end to the  
other element.
3. Connection according to claim 1, wherein
- the bolt (3) is fixed at its other end by  
means of a further tensioning body attached  
to the other element,
  - the other tensioning body is rotatable with  
respect to the other element about an axis  
extending essentially perpendicular to the  
bolt,

WO 00/36308

PCT/DE99/03336

14

- 5        - the fastening of the bolt (3) to the other  
         tensioning body is rotatable about an axis  
         distanced from the axis of this tensioning  
         body and approximately parallel thereto, and
- 10       - the other tensioning body is fixed in any  
         rotational position with respect to bolt (3)  
         and/or the other element by adhesion.
- 15       4. Connection according to one of the preceding  
         claims, wherein the adhesion is frictional  
         locking.
5. Connection according to one of the preceding  
         claims, wherein the bolt (3) penetrates at least  
         one of the elements along a certain length.
6. Connection according to one of the preceding  
         claims, wherein the bolt (3) penetrates a third  
         element that is arranged between the two  
         elements.
- 20       7. Connection according to one of the preceding  
         claims, wherein the tensioning body (1) is  
         accommodated in a cavity of the element that  
         fixes the tensioning body (1) at both sides in  
         the longitudinal direction of the bolt (3).

WO 00/36308

PCT/DE99/03336

15

8. Connection according to one of the preceding claims, wherein the connection between bolt (3) and tensioning body (1) is produced by means of a retaining head (2), which is attached detachably to the bolt (3) and rotatable relative to the tensioning body (1).

9. Connection according to claim 8, wherein the retaining head (2) is also detachably connected to the tensioning body (1).

10. Connection according to claim 8 or 9, wherein the retaining head (2) has a slot (7) extending essentially in the axial direction of the tensioning body (1), whose flanks engage on both sides of the bolt (3) in a groove (8) extending in an azimuthal direction of the bolt (3).

11. Connection according to claim 10, wherein the azimuthally extending groove (8) of the bolt (3) is a surrounding annular groove.

12. Connection according to one of the preceding claims, wherein the bolt (3), at its end, and/or the retaining head (2) is accommodated in an extra-axial cavity (4) of the tensioning body (1) and is fixed in the longitudinal direction of the bolt (3).

WO 00/36308

PCT/DE99/03336

16

13.Connection according to one of the preceding claims, **wherein** the bolt (3) penetrates an azimuthally extending slot (5) of the tensioning body (1).

5 14.Connection according to claim 13, **wherein** there extends between an axial end face of the tensioning body (1) and the azimuthally extending slot (5) of the tensioning body (1) an essentially axial slot (6), whose width is  
10 greater than the diameter of the bolt (3).

15 15.Connection according to one of the preceding claims, **wherein** a cavity of the element and/or of the tensioning body (1) and/or the tensioning body (1) itself and/or the retaining head (2) is formed so as to be essentially cylindrical.

16.Connection according to one of the preceding claims, **wherein** a cavity of the element and/or of the tensioning body (1) is open on an axial end face.

20 17.Connection according to one of the preceding claims, **wherein** a cavity of the element and/or of the tensioning body (1) is closed on an axial end face.

WO 00/36308

PCT/DE99/03336

1/2

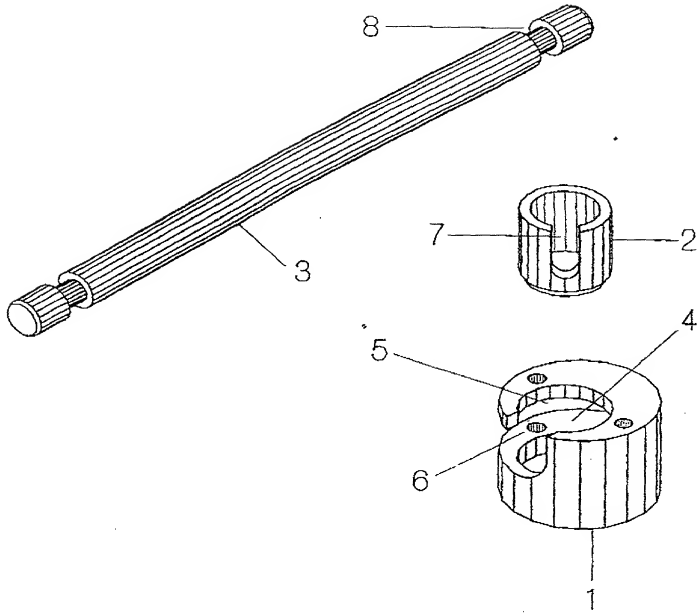


Fig. 1

WO 00/36308

PCT/DE99/03336

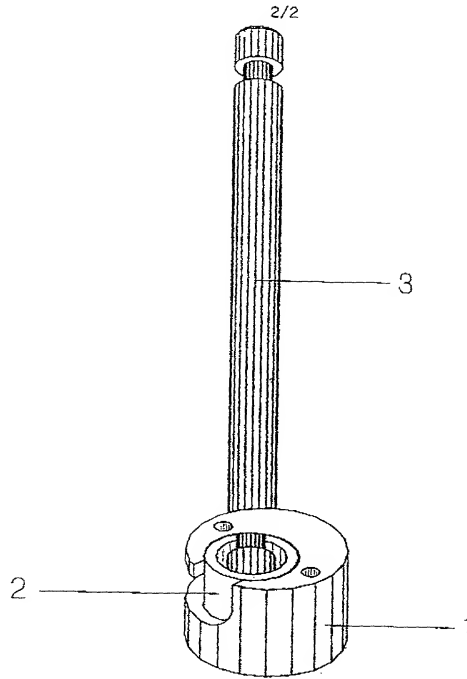


Fig. 2

# Declaration and Power of Attorney For Patent Application

## Erklärung Für Patentanmeldungen Mit Vollmacht

### German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Lösbare Verbindung zweier

Elemente

deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigelegt ist.

☒ am 14.10.1999 unter der

Anmeldungsseriennummer PCT/DE 99/03336

eingereicht wurde und am \_\_\_\_\_  
abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Detachable connection of

two elements

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on October 14, 1999 as

Application Serial No. PCT/DE 99/03336

and was amended on \_\_\_\_\_  
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

# German Language Declaration

Prior foreign applications

Priorität beansprucht

19857795.8

(Number)  
(Nummer)

Germany

(Country)  
(Land)

15.12.1998

(Day/Month/Year Filed)  
(Tag/Monat/Jahr eingereicht)

Priority Claimed

☒ Yes  
Ja

☐ No  
Nein

(Number)  
(Nummer)

(Country)  
(Land)

(Day/Month/Year Filed)  
(Tag/Monat/Jahr eingereicht)

☐ Yes  
Ja

☐ No  
Nein

(Number)  
(Nummer)

(Country)  
(Land)

(Day/Month/Year Filed)  
(Tag/Monat/Jahr eingereicht)

☐ Yes  
Ja

☐ No  
Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 112 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)  
(Anmeldeserienummer)

(Filing Date)  
(Anmeldedatum)

(Status)  
(patentiert, anhängig,  
aufgegeben)

(Status)  
(patented, pending,  
abandoned)

(Application Serial No.)  
(Anmeldeserienummer)

(Filing Date)  
(Anmeldedatum)

(Status)  
(patentiert, anhängig,  
aufgegeben)

(Status)  
(patented, pending,  
abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden können, und dass dergartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon



## German Language Declaration

**VERTRETUNGSVOLLMACHT:** Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (Name und Registrationsnummer anführen)

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

EDWIN D. SCHINDLER, Registration No. 31,459

Telefongespräche bitte richten an:  
(Name und Telefonnummer)

Direct Telephone Calls to: (name and telephone number)

Edwin D. Schindler - Telephone: (631) 474-5373

Postanschrift: Edwin D. Schindler  
Five Hirsch Avenue  
P. O. Box 966  
Coram, New York 11727-0966

Send Correspondence to:

Voller Name des einzigen oder ursprünglichen Erfinders: <u>Niklaus, Halmar</u>		Full name of sole or first inventor	
Unterschrift des Erfinders <u>[Signature]</u>	Datum <u>June 18, 2001</u>	Inventor's signature	Date
Wohnsitz <u>97654 Bastheim, Fed. Rep. of Germany</u>		Residence	
Staatsangehörigkeit <u>german</u>		Citizenship	
Postanschrift <u>Lindenweg 2</u>		Post Office Address	
<u>D-97654 Bastheim, Federal Republic of Germany</u>			
Voller Name des zweiten Miterfinders (falls zutreffend)		Full name of second joint inventor, if any	
Unterschrift des Erfinders	Datum	Second Inventor's signature	Date
Wohnsitz		Residence	
Staatsangehörigkeit		Citizenship	
Postanschrift		Post Office Address	

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors.)